

SEQUENCE LISTING

<110> WU, TZZY-CHOOU
HUNG, CHIEN, FU

<120> ANTI-CANCER DNA VACCINE EMPLOYING PLASMIDS ENCODING
SIGNAL SEQUENCE, MUTANT ONCOPROTEIN ANTIGEN, AND HEAT
SHOCK PROTEIN

<130> JHV-050.01 (19546-5001)

<140> 10/555,669

<141> 2004-05-05

<150> PCT/US04/013756

<151> 2004-05-05

<150> 60/467,602

<151> 2003-05-05

<160> 20

<170> PatentIn Ver. 3.3

<210> 1

<211> 297

<212> DNA

<213> Human papillomavirus

<220>

<221> CDS

<222> (1)..(297)

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Pro	Glu	Thr	Thr	Asp	Leu	Tyr	Cys	Tyr	Glu	Gln	Leu	Asn	Asp	Ser	Ser	
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Glu	Glu	Glu	Asp	Glu	Ile	Asp	Gly	Pro	Ala	Gly	Gln	Ala	Glu	Pro	Asp	
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Arg	Ala	His	Tyr	Asn	Ile	Val	Thr	Phe	Cys	Cys	Lys	Cys	Asp	Ser	Thr	
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ctt	cgg	ttg	tgc	gta	caa	agc	aca	cac	gta	gac	att	cgt	act	ttg	gaa	240
Leu	Arg	Leu	Cys	Val	Gln	Ser	Thr	His	Val	Asp	Ile	Arg	Thr	Leu	Glu	
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gac	ctg	tta	atg	ggc	aca	cta	gga	att	gtg	tgc	ccc	atc	tgt	tct	cag	288
Asp	Leu	Leu	Met	Gly	Thr	Leu	Gly	Ile	Val	Cys	Pro	Ile	Cys	Ser	Gln	
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Asp Lys Leu

297

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35 40 45
Arg Ala His Tyr Asn Ile Val Thr Phe Cys Cys Lys Cys Asp Ser Thr
50 55 60
Leu Arg Leu Cys Val Gln Ser Thr His Val Asp Ile Arg Thr Leu Glu
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Asp Lys Leu

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35 40 45
Arg Ala His Tyr Asn Ile Val Thr Phe Cys Cys Lys Cys Asp Ser Thr
50 55 60
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Lys Pro

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 35 40 45
 Val Tyr Asp Phe Ala Phe Arg Asp Leu Cys Ile Val Tyr Arg Asp Gly
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 Asn Pro Tyr Ala Val Cys Asp Lys Cys Leu Lys Phe Tyr Ser Lys Ile
 65 70 75 80
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 85 90 95
 Gln Gln Tyr Asn Lys Pro Leu Cys Asp Leu Leu Ile Arg Cys Ile Asn
 100 105 110
 Cys Gln Lys Pro Leu Cys Pro Glu Glu Lys Gln Arg His Leu Asp Lys
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 35 40 45
 Asp Leu Cys Ile Val Tyr Arg Asp Gly Asn Pro Tyr Ala Val Cys Asp
 50 55 60

Lys Cys Leu Lys Phe Tyr Ser Lys Ile Ser Glu Tyr Arg His Tyr Cys
65 70 75 80

Tyr Ser Leu Tyr Gly Thr Thr Leu Glu Gln Gln Tyr Asn Lys Pro Leu
85 90 95

Cys Asp Leu Leu Ile Arg Cys Ile Asn Cys Gln Lys Pro Leu Cys Pro
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Glu Glu Lys Gln Arg His Leu Asp Lys Lys Gln Arg Phe His Asn Ile
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Thr Arg Arg Glu Thr Gln Leu
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<212> DNA

<213> Human papillomavirus

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<211> 127

<212> PRT

<213> Human papillomavirus

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20 25 30

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35 40 45

Thr Thr Asp Leu Tyr Cys Tyr Glu Gln Leu Asn Asp Ser Ser Glu Glu
50 55 60

Glu Asp Glu Ile Asp Gly Pro Ala Gly Gln Ala Glu Pro Asp Arg Ala
65 70 75 80

His Tyr Asn Ile Val Thr Phe Cys Cys Lys Cys Asp Ser Thr Leu Arg
85 90 95

Leu Cys Val Gln Ser Thr His Val Asp Ile Arg Thr Leu Glu Asp Leu
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Leu Met Gly Thr Leu Gly Ile Val Cys Pro Ile Cys Ser Gln Pro
 115 120 125

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<210> 9
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 <212> DNA
 <213> Mycobacterium tuberculosis

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<212> PRT

<213> Mycobacterium tuberculosis

<400> 10

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Leu Val Gly Gln Pro Ala Lys Asn Gln Ala Val Thr Asn Val Asp Arg
 50           55           60

Thr Val Arg Ser Val Lys Arg His Met Gly Ser Asp Trp Ser Ile Glu
 65           70           75           80

Ile Asp Gly Lys Lys Tyr Thr Ala Pro Glu Ile Ser Ala Arg Ile Leu
      85           90           95

Met Lys Leu Lys Arg Asp Ala Glu Ala Tyr Leu Gly Glu Asp Ile Thr
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Asp Ala Val Ile Thr Thr Pro Ala Tyr Phe Asn Asp Ala Gln Arg Gln
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Val Asn Glu Pro Thr Ala Ala Ala Leu Ala Tyr Gly Leu Asp Lys Gly
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Glu Lys Glu Gln Arg Ile Leu Val Phe Asp Leu Gly Gly Gly Thr Phe
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Asp Val Ser Leu Leu Glu Ile Gly Glu Gly Val Val Glu Val Arg Ala
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Thr Ser Gly Asp Asn His Leu Gly Gly Asp Asp Trp Asp Gln Arg Val
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Val Asp Trp Leu Val Asp Lys Phe Lys Gly Thr Ser Gly Ile Asp Leu
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Thr Lys Asp Lys Met Ala Met Gln Arg Leu Arg Glu Ala Ala Glu Lys
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Ala Lys Ile Glu Leu Ser Ser Ser Gln Ser Thr Ser Ile Asn Leu Pro
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Tyr Ile Thr Val Asp Ala Asp Lys Asn Pro Leu Phe Leu Asp Glu Gln
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 Thr Arg Lys Pro Phe Gln Ser Val Ile Ala Asp Thr Gly Ile Ser Val
 290 295 300
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 305 310 315 320
 Ala Val Thr Asp Leu Val Lys Glu Leu Thr Gly Gly Lys Glu Pro Asn
 325 330 335
 Lys Gly Val Asn Pro Asp Glu Val Val Ala Val Gly Ala Ala Leu Gln
 340 345 350
 Ala Gly Val Leu Lys Gly Glu Val Lys Asp Val Leu Leu Leu Asp Val
 355 360 365
 Thr Pro Leu Ser Leu Gly Ile Glu Thr Lys Gly Gly Val Met Thr Arg
 370 375 380
 Leu Ile Glu Arg Asn Thr Thr Ile Pro Thr Lys Arg Ser Glu Thr Phe
 385 390 395 400
 Thr Thr Ala Asp Asp Asn Gln Pro Ser Val Gln Ile Gln Val Tyr Gln
 405 410 415
 Gly Glu Arg Glu Ile Ala Ala His Asn Lys Leu Leu Gly Ser Phe Glu
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 Leu Thr Gly Ile Pro Pro Ala Pro Arg Gly Ile Pro Gln Ile Glu Val
 435 440 445
 Thr Phe Asp Ile Asp Ala Asn Gly Ile Val His Val Thr Ala Lys Asp
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 465 470 475 480
 Leu Ser Lys Glu Asp Ile Asp Arg Met Ile Lys Asp Ala Glu Ala His
 485 490 495
 Ala Glu Glu Asp Arg Lys Arg Arg Glu Glu Ala Asp Val Arg Asn Gln
 500 505 510
 Ala Glu Thr Leu Val Tyr Gln Thr Glu Lys Phe Val Lys Glu Gln Arg
 515 520 525
 Glu Ala Glu Gly Gly Ser Lys Val Pro Glu Asp Thr Leu Asn Lys Val
 530 535 540
 Asp Ala Ala Val Ala Glu Ala Lys Ala Ala Leu Gly Gly Ser Asp Ile
 545 550 555 560
 Ser Ala Ile Lys Ser Ala Met Glu Lys Leu Gly Gln Glu Ser Gln Ala
 565 570 575

Leu Gly Gln Ala Ile Tyr Glu Ala Ala Gln Ala Ala Ser Gln Ala Thr
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 610 615 620
 Lys
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 <212> DNA
 <213> Artificial Sequence

<220>
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 <222> (1)..(2103)

<220>
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 Pro Glu Thr Thr Asp Leu Tyr Cys Tyr Glu Gln Leu Asn Asp Ser Ser
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 Glu Glu Glu Asp Glu Ile Asp Gly Pro Ala Gly Gln Ala Glu Pro Asp
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 Arg Ala His Tyr Asn Ile Val Thr Phe Cys Cys Lys Cys Asp Ser Thr
 50 55 60
 ctt cgg ttg tgc gta caa agc aca cac gta gac att cgt act ttg gaa 240
 Leu Arg Leu Cys Val Gln Ser Thr His Val Asp Ile Arg Thr Leu Glu
 65 70 75 80
 gac ctg tta atg ggc aca cta gga att gtg tgc ccc atc tgt tct caa 288
 Asp Leu Leu Met Gly Thr Leu Gly Ile Val Cys Pro Ile Cys Ser Gln
 85 90 95
 gga tcc atg gct cgt gcg gtc ggg atc gac ctc ggg acc acc aac tcc 336
 Gly Ser Met Ala Arg Ala Val Gly Ile Asp Leu Gly Thr Thr Asn Ser
 100 105 110
 gtc gtc tcg gtt ctg gaa ggt ggc gac ccg gtc gtc gtc gcc aac tcc 384
 Val Val Ser Val Leu Glu Gly Gly Asp Pro Val Val Val Ala Asn Ser
 115 120 125

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Glu Gly Ser Arg Thr Thr Pro Ser Ile Val Ala Phe Ala Arg Asn Gly	
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Glu Val Leu Val Gly Gln Pro Ala Lys Asn Gln Ala Val Thr Asn Val	
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Asp Arg Thr Val Arg Ser Val Lys Arg His Met Gly Ser Asp Trp Ser	
165 170 175	
ata gag att gac ggc aag aaa tac acc gcg ccg gag atc agc gcc cgc	576
Ile Glu Ile Asp Gly Lys Lys Tyr Thr Ala Pro Glu Ile Ser Ala Arg	
180 185 190	
att ctg atg aag ctg aag cgc gac gcc gag gcc tac ctc ggt gag gac	624
Ile Leu Met Lys Leu Lys Arg Asp Ala Glu Ala Tyr Leu Gly Glu Asp	
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Ile Thr Asp Ala Val Ile Thr Thr Pro Ala Tyr Phe Asn Asp Ala Gln	
210 215 220	
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Arg Gln Ala Thr Lys Asp Ala Gly Gln Ile Ala Gly Leu Asn Val Leu	
225 230 235 240	
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Arg Ile Val Asn Glu Pro Thr Ala Ala Ala Leu Ala Tyr Gly Leu Asp	
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Lys Gly Glu Lys Glu Gln Arg Ile Leu Val Phe Asp Leu Gly Gly Gly	
260 265 270	
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Thr Phe Asp Val Ser Leu Leu Glu Ile Gly Glu Gly Val Val Glu Val	
275 280 285	
cgt gcc act tcg ggt gac aac cac ctc ggc ggc gac gac tgg gac cag	912
Arg Ala Thr Ser Gly Asp Asn His Leu Gly Gly Asp Asp Trp Asp Gln	
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cgg gtc gtc gat tgg ctg gtg gac aag ttc aag ggc acc agc ggc atc	960
Arg Val Val Asp Trp Leu Val Asp Lys Phe Lys Gly Thr Ser Gly Ile	
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Asp Leu Thr Lys Asp Lys Met Ala Met Gln Arg Leu Arg Glu Ala Ala	
325 330 335	
gag aag gca aag atc gag ctg agt tcg agt cag tcc acc tcg atc aac	1056
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acc	agg	ctc	atc	gag	cgc	aac	acc	acg	atc	ccc	acc	aag	cgg	tcg	gag	1488
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625 630 635 640	
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<210> 12

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<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic construct

<400> 12

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35 40 45	
Arg Ala His Tyr Asn Ile Val Thr Phe Cys Cys Lys Cys Asp Ser Thr	
50 55 60	
Leu Arg Leu Cys Val Gln Ser Thr His Val Asp Ile Arg Thr Leu Glu	
65 70 75 80	

Asp	Leu	Leu	Met	Gly	Thr	Leu	Gly	Ile	Val	Cys	Pro	Ile	Cys	Ser	Gln	85	90	95	
Gly	Ser	Met	Ala	Arg	Ala	Val	Gly	Ile	Asp	Leu	Gly	Thr	Thr	Asn	Ser	100	105	110	
Val	Val	Ser	Val	Leu	Glu	Gly	Gly	Asp	Pro	Val	Val	Val	Ala	Asn	Ser	115	120	125	
Glu	Gly	Ser	Arg	Thr	Thr	Pro	Ser	Ile	Val	Ala	Phe	Ala	Arg	Asn	Gly	130	135	140	
Glu	Val	Leu	Val	Gly	Gln	Pro	Ala	Lys	Asn	Gln	Ala	Val	Thr	Asn	Val	145	150	155	160
Asp	Arg	Thr	Val	Arg	Ser	Val	Lys	Arg	His	Met	Gly	Ser	Asp	Trp	Ser	165	170	175	
Ile	Glu	Ile	Asp	Gly	Lys	Lys	Tyr	Thr	Ala	Pro	Glu	Ile	Ser	Ala	Arg	180	185	190	
Ile	Leu	Met	Lys	Leu	Lys	Arg	Asp	Ala	Glu	Ala	Tyr	Leu	Gly	Glu	Asp	195	200	205	
Ile	Thr	Asp	Ala	Val	Ile	Thr	Thr	Pro	Ala	Tyr	Phe	Asn	Asp	Ala	Gln	210	215	220	
Arg	Gln	Ala	Thr	Lys	Asp	Ala	Gly	Gln	Ile	Ala	Gly	Leu	Asn	Val	Leu	225	230	235	240
Arg	Ile	Val	Asn	Glu	Pro	Thr	Ala	Ala	Ala	Leu	Ala	Tyr	Gly	Leu	Asp	245	250	255	
Lys	Gly	Glu	Lys	Glu	Gln	Arg	Ile	Leu	Val	Phe	Asp	Leu	Gly	Gly	Gly	260	265	270	
Thr	Phe	Asp	Val	Ser	Leu	Leu	Glu	Ile	Gly	Glu	Gly	Val	Val	Glu	Val	275	280	285	
Arg	Ala	Thr	Ser	Gly	Asp	Asn	His	Leu	Gly	Gly	Asp	Asp	Trp	Asp	Gln	290	295	300	
Arg	Val	Val	Asp	Trp	Leu	Val	Asp	Lys	Phe	Lys	Gly	Thr	Ser	Gly	Ile	305	310	315	320
Asp	Leu	Thr	Lys	Asp	Lys	Met	Ala	Met	Gln	Arg	Leu	Arg	Glu	Ala	Ala	325	330	335	
Glu	Lys	Ala	Lys	Ile	Glu	Leu	Ser	Ser	Ser	Gln	Ser	Thr	Ser	Ile	Asn	340	345	350	
Leu	Pro	Tyr	Ile	Thr	Val	Asp	Ala	Asp	Lys	Asn	Pro	Leu	Phe	Leu	Asp	355	360	365	
Glu	Gln	Leu	Thr	Arg	Ala	Glu	Phe	Gln	Arg	Ile	Thr	Gln	Asp	Leu	Leu	370	375	380	

Asp	Arg	Thr	Arg	Lys	Pro	Phe	Gln	Ser	Val	Ile	Ala	Asp	Thr	Gly	Ile	385	390	395	400
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Thr	Arg	Leu	Ile	Glu	Arg	Asn	Thr	Thr	Ile	Pro	Thr	Lys	Arg	Ser	Glu	485	490	495	
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Tyr	Gln	Gly	Glu	Arg	Glu	Ile	Ala	Ala	His	Asn	Lys	Leu	Leu	Gly	Ser	515	520	525	
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Ala	His	Ala	Glu	Glu	Asp	Arg	Lys	Arg	Arg	Glu	Glu	Ala	Asp	Val	Arg	595	600	605	
Asn	Gln	Ala	Glu	Thr	Leu	Val	Tyr	Gln	Thr	Glu	Lys	Phe	Val	Lys	Glu	610	615	620	
Gln	Arg	Glu	Ala	Glu	Gly	Gly	Ser	Lys	Val	Pro	Glu	Asp	Thr	Leu	Asn	625	630	635	640
Lys	Val	Asp	Ala	Ala	Val	Ala	Glu	Ala	Lys	Ala	Ala	Leu	Gly	Gly	Ser	645	650	655	
Asp	Ile	Ser	Ala	Ile	Lys	Ser	Ala	Met	Glu	Lys	Leu	Gly	Gln	Glu	Ser	660	665	670	
Gln	Ala	Leu	Gly	Gln	Ala	Ile	Tyr	Glu	Ala	Ala	Gln	Ala	Ala	Ser	Gln	675	680	685	

Ala Thr Gly Ala Ala His Pro Gly Ser Ala Asp Glu Ser
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<210> 13
<211> 6681
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic
vector

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<210> 14

<211> 37

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 14

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<210> 15

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic primer

<400> 15

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<210> 16

<211> 9

<212> PRT

<213> Human papillomavirus

<400> 16

Arg Ala His Tyr Asn Ile Val Thr Phe
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<210> 17

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<221> CDS

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

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21

<210> 18

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 18

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<210> 19

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<221> CDS

<222> (1)..(21)

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<223> Description of Artificial Sequence: Synthetic
oligonucleotide

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ctc tac ggt tat ggg caa tta
Leu Tyr Gly Tyr Gly Gln Leu
1 5

21

<210> 20

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic
peptide

<400> 20

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